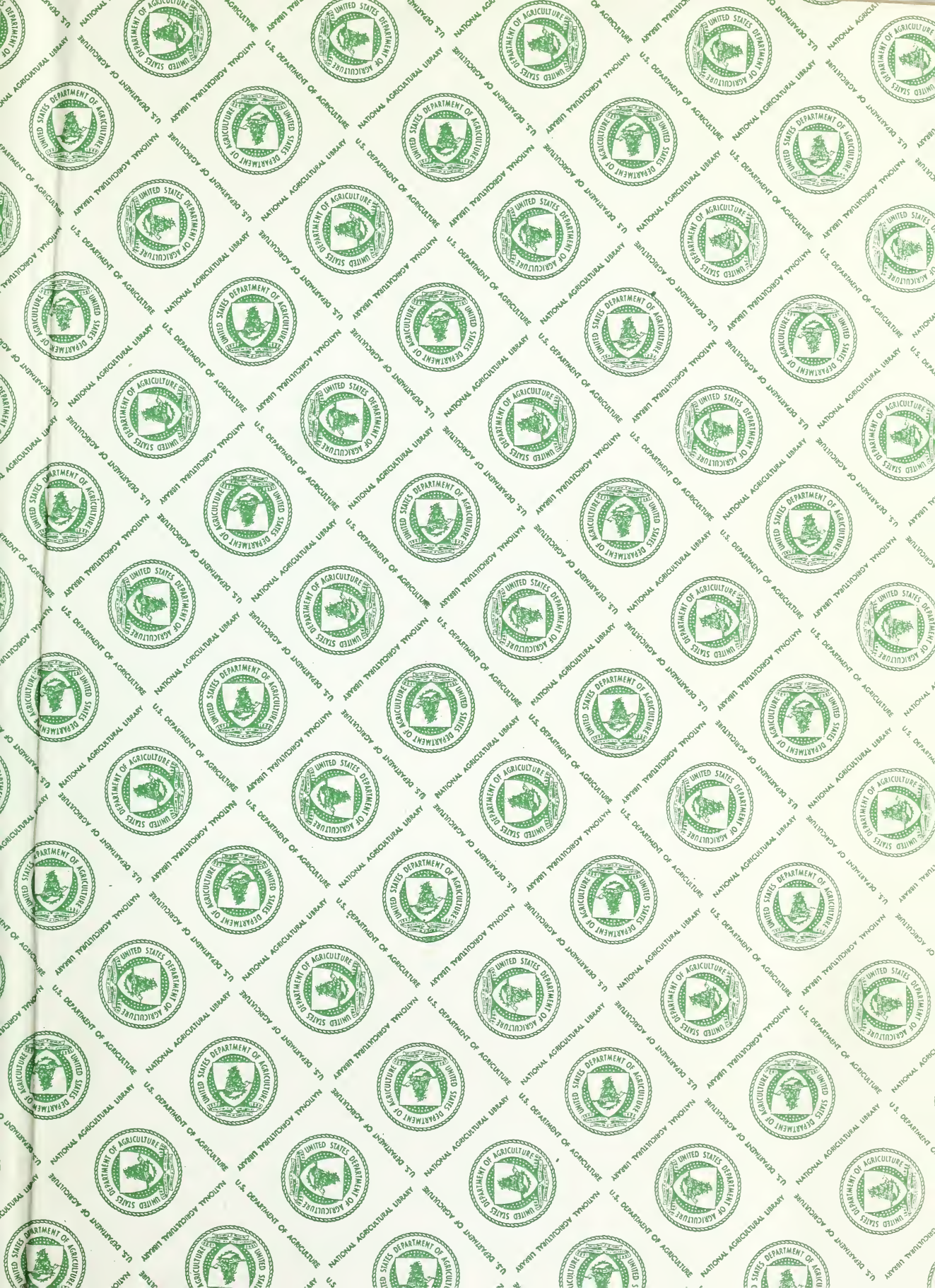


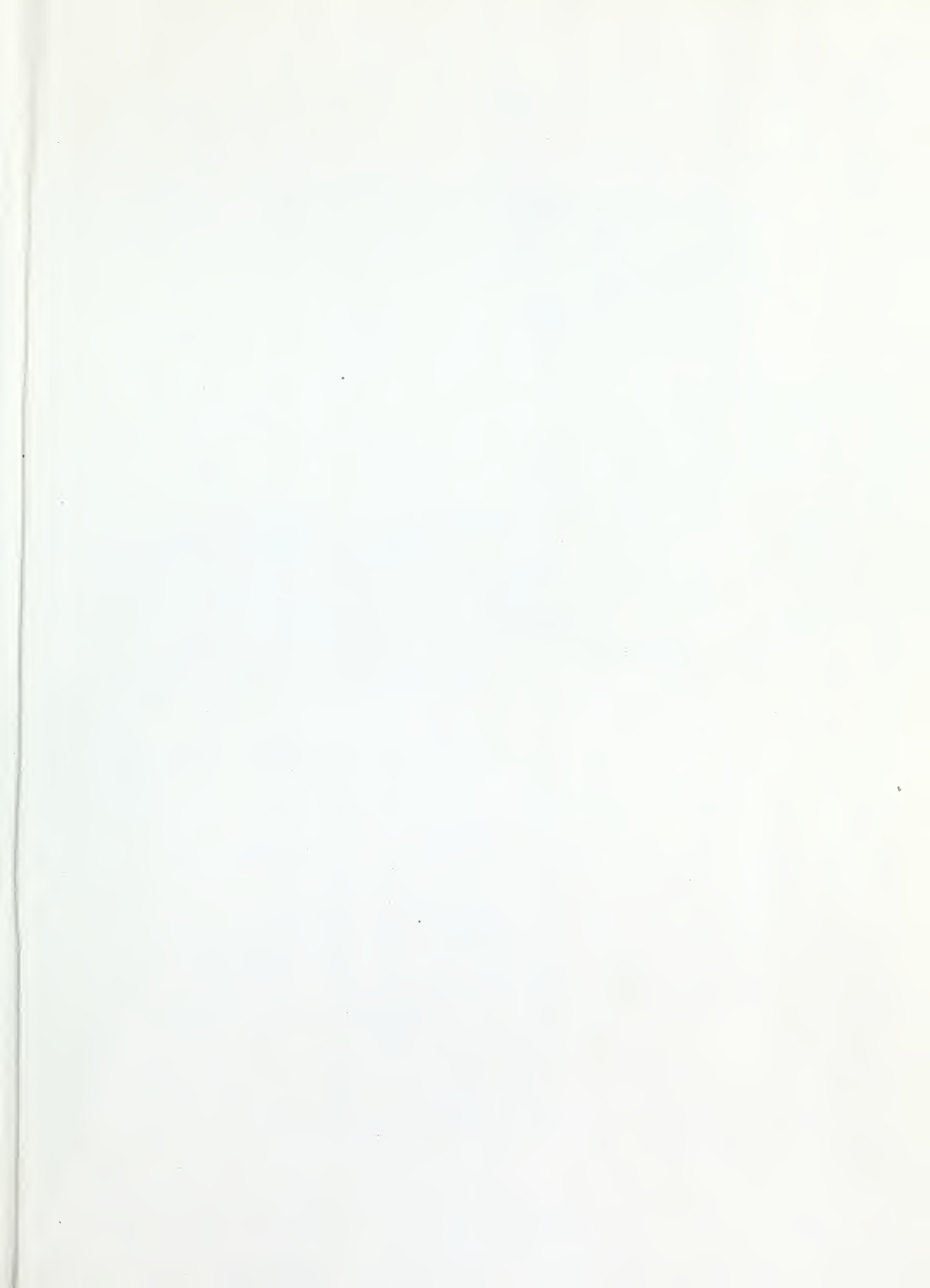
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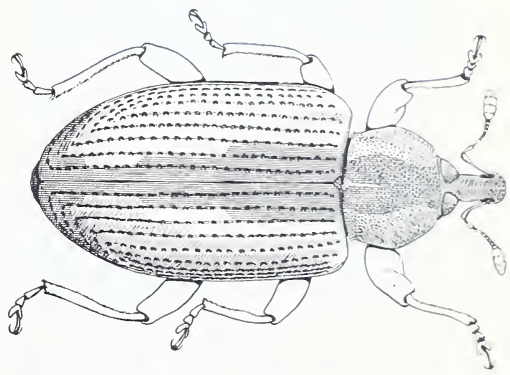
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THE ALFALFA WEEVIL

How To Control It





THE ALFALFA WEEVIL: How To Control It

Alfalfa is the Nation's most valuable hay crop.

Farmers grow more of it today than any other legume. They prefer it for livestock feed because of its high yield, its palatability, its richness in protein, and its high content of calcium and vitamins.

But on many farmlands the larvae, or young, of the alfalfa weevil¹ and the adults take the nutritional value out of alfalfa by feeding on the plant tips, leaves, and buds. They prevent the profitable production of seed. They reduce crop yields and cause millions of dollars of damage each year.

NATURE OF DAMAGE

The larvae do the greatest damage to the first crop of alfalfa. They feed within the plant tips, on the upper leaves as they open, and then on the lower foliage, skeletonizing the leaves. Damaged leaves

dry rapidly and the field takes on a grayish to whitish cast.

After the first crop of alfalfa has been cut, the larvae crawl to the new shoots of the second crop and continue feeding. They retard new plant growth and may seriously damage the second crop. Newly emerged adults also feed on and severely damage the new shoots.

ORIGIN AND SPREAD

The alfalfa weevil was first found in the United States near Salt Lake City, Utah, in 1904. It has since spread throughout Utah and into Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Wash-

Photograph on cover: Alfalfa weevils chew up the tips, leaves, and buds on alfalfa plants. In so doing, they reduce crop yields and cause serious financial loss to growers.

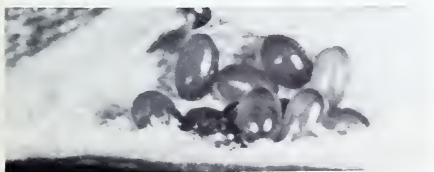
¹ *Hypera postica*.

ington, and Wyoming, and into the Provinces of Alberta and Saskatchewan in Canada. Between 1951 and 1967 it was found in these 28 States: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

The weevils spread by flying and crawling. Many are carried to haystacks during haying operations. They may move long distances by flight or in infested shipments of baled hay or other farm products.

DEVELOPMENT

Alfalfa weevils pass through egg, larval, pupal, and adult stages in their development. In most areas, they produce only one generation during each growing season. But in California and in some of the Northeastern and Southern States, they may have a partial second generation. When cold weather comes, the adults crawl down into the crowns of the alfalfa or seek other sheltered places in alfalfa fields, nearby ditchbanks, or field borders, where they overwinter.



BN-20796

Eggs.



BN-20795

Larva.



BN-20799

Adult.

In early spring, the weevils become active. Each female lays several hundred eggs in clusters—2 to 25 eggs in each cluster. In the Western States the weevils first lay a considerable number of eggs inside dead hollow stems of alfalfa, grass, and weeds lying on the ground. By the time the alfalfa is 6 inches tall, they have gradually shifted their egg laying to the growing stems. In the Northeastern and Southern States the weevils lay most of their eggs in the green alfalfa.

The eggs are oval and about one-fiftieth inch long. They are lemon yellow when first laid and brownish when ready to hatch. In warm weather they hatch in 1 to 2 weeks; in cool weather they accumulate in the fields until temperatures favorable to hatching occur.

Larvae appear in early spring and are most numerous from the time the plants are about 6 inches tall until they reach the early flowerbud stage of development. The peak of abundance varies with the season and in different areas of infestation. The newly hatched larvae are about one-twentieth inch long and are yellow, except for a shiny black head.

Larvae feed on alfalfa plants 3 to 4 weeks. During this time they molt, or shed their skins, three times. When full grown, they are about three-eighths inch long. Their heads are black; their bodies, green. They have a wide white stripe running down the middle of their backs paralleled by two faint white stripes on either side.

When they have finished feeding, the larvae spin cocoons about one-



BN-20800

Weevil larvae feeding on alfalfa.

fourth inch long on the plants, or within the curl of fallen dead leaves, or in other litter on the ground. They pupate within the cocoons and change to adults. The adult weevils emerge in 1 to 2 weeks.

The adults are snout beetles and are about three-sixteenths inch long. At first they are brown, and have a broad dark stripe extending down their backs from the front of their heads to more than half the length of their bodies. As the weevils age, many of them become uniformly dark brown or almost black.

Most of the old overwintering adults have died by the time the first crop has been harvested, although in certain areas some of them may survive to lay eggs in the second crop. Most of the young adults leave the alfalfa fields soon after emergence, and remain inactive dur-

ing the summer in protected places nearby. They return to alfalfa fields in the fall and mate at this time or the following spring.

The females lay most of their eggs in the spring. However, they lay some eggs in the fall before cold weather sets in. In the lower valleys of western Colorado, and in the Northeast and South, two-thirds to three-fourths of the females lay a considerable number of their eggs in the fall. Most of these eggs do not hatch until the following spring.

CONTROL

Once alfalfa weevils infest a field, they usually cause damage season after season—unless they are controlled. You can control them by following recommended crop-management practices and by applying insecticides.



BN-20798

Left: Alfalfa that has been sprayed for alfalfa weevil control. **Right:** Untreated.

Crop Management

To reduce weevil damage—

- Grow dense, vigorous stands; follow approved cultural practices for alfalfa.

- Cut the first crop when most of the plants are in the bud stage.

- Cut plants clean and close.

Remove hay from fields promptly. A field free of crop remnants deprives larvae of food and shelter and exposes them to the sun. The exposure is usually fatal.

Insecticides

For best control, destroy weevil larvae by spraying the alfalfa in the spring when most of the growing tips are beginning to show damage. Apply one of the following insecticides in the amount shown:

<i>Insecticide</i>	<i>Amount of active ingredient to apply per acre</i>
Diazinon.....	1 pound.
Azinphosmethyl (Guthion).....	8 ounces.
Malathion.....	1 pound.
Methoxychlor.....	1½ pounds.
Parathion.....	4 ounces.

Prepare a spray with an emulsifiable concentrate of the insecticide by mixing it with water, according to directions on the container, to give you the proper dosage per acre. If you use a ground sprayer, you will need at least 10 gallons of spray per acre; if you make the application by airplane, you can use as little as 2 gallons per acre.

If large numbers of larvae and newly emerged adults are present when the first crop is harvested, spray the stubble as soon as the crop is removed.

When the pea aphid is likely to

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cause damage, apply a combination spray of malathion and methoxychlor in the amounts shown.

WEEVIL PARASITE

In parts of the Western States, a small black wasp, commonly called the weevil parasite,² often kills 80 to 90 percent of the larvae that appear at the beginning of the season. The weevil parasite lays its egg in the weevil larva; the parasite larva hatching from the egg feeds inside the host. A parasitized weevil larva dies soon after it spins its cocoon. The parasite larva then constructs a brown white-banded cocoon of its own.

After the first crop buds, parasitism declines and is negligible during the second crop.

The parasite has been introduced into Northeastern and Southern States and Ohio. It has become established at release sites in these States. Several other parasite species have also been introduced into these States. Some of them have become established, but it is too early (1967) to know how effective they will become in controlling the weevil.

² *Bathyplectes curculionis*.

PRECAUTIONS

Insecticides improperly used can cause injury to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Keep insecticides in closed, well-labeled containers in a dry place.

Store them where they will not contaminate food or feed, and where children and animals cannot reach them.

When handling an insecticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of insecticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of insecticide mists.

Avoid spilling insecticide concentrate on your skin, and keep it out of your eyes, nose, and mouth. If you spill any on your skin, wash it off



BN-20792

A weevil parasite, above, kills 80 to 90 percent of the early-season larvae in the Western States.



BN-20791

This farmer is spraying for control of weevil larvae.

immediately with soap and water. If you spill any on your clothing, remove contaminated clothing immediately and wash the skin thoroughly with soap and water. Launder the clothing before wearing it again.

After handling an insecticide, do not eat, drink, or smoke until you have washed your hands and face. Wash your hands and face and any other exposed skin immediately after applying insecticide.

Parathion and azinphosmethyl are highly toxic and may be fatal if swallowed, inhaled, or absorbed through the skin. They should be applied only by a trained operator who is thoroughly familiar with their hazards and who will assume full responsibility for safe use.

To protect water resources, fish

and wildlife, do not contaminate lakes, streams, or ponds with insecticide. Do not clean spraying equipment or dump excess spray material near such water.

To protect honey bees and other pollinating insects that are necessary in the production of many crops, apply insecticide, when possible, during hours when the insects are not visiting the plants.

Avoid drift of insecticide to nearby bee yards, crops, or livestock.

Notify beekeepers at least 48 hours before spraying large acreages, so that measures can be taken to protect the bees.

Dispose of empty insecticide containers at a sanitary land-fill dump, or bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies.

If you have trash collection service, wrap several small containers in layers of newspapers and place them in the trash can.

After applying one of the following insecticides for alfalfa weevil control, wait the indicated number of days before cutting alfalfa or grazing animals on the treated

alfalfa: Methoxychlor, 7 days; parathion, 15 days; azinphosmethyl, 16 days.

No waiting period is required for malathion. After applying diazinon, wait 4 days before grazing livestock and 10 days before cutting for hay. Do not apply azinphosmethyl more than once per cutting.

Prepared by
Entomology Research Division
Agricultural Research Service



Use Pesticides Safely

FOLLOW THE LABEL
U.S. DEPARTMENT OF AGRICULTURE

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